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10/811,078	03/26/2004	Toshiaki Kakutani	MIPFP083	8066

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EXAMINER	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/811,078	KAKUTANI, TOSHIAKI	
	Examiner	Art Unit	
	Quang N. Vo	2625	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *23 January 2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-8,16,17,20 and 23* is/are pending in the application.

4a) Of the above claim(s) ~~*9-15,18,19,21,22,24 and 25*~~ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-8,16,17,20 and 23* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/ are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

Applicant argues that Otsuki does not teach a priority order of individual pixels in the pixel group for dot creation as in claim 1 subject matter; and the combination of the Shimada and Otsuki does not disclose an image output device having the claimed configuration that receives the dot number data, specifies a priority order of individual pixels, and determines positions of dot-on pixels in the pixel group with respect to each type of dot, based on the dot number data of the pixel group with respect to each type of dot and the specified priority order .

In reply, Shimuzu differs from claim 1, in that he does not explicitly teach image output device comprising: a number data receiving module that receives the dot number data of the pixel group with respect to each type of dot; a pixel position determination module that determines positions of dot-on pixels in the pixel group with respect to each type of dot, based on the dot number data of the pixel group with respect to each type of dot and the specified priority order; and a dot formation module that creates the multiple different types of dots at the determined positions of the dot-on pixels and a priority order specification module that specifies a priority order of individual pixels in the pixel group for dot creation.

Shimada discloses image output device comprising: a number data receiving module that receives the dot number data of the pixel group with

respect to each type of dot (e.g., figure 12, column 10, lines 48-52); a transfer buffer that outputs dot on-off signals to the ink spout heads, column 8, lines 54-65); a pixel position determination module that determines positions of dot-on pixels in the pixel group with respect to each type of dot, based on the dot number data of the pixel group with respect to each type of dot (e.g., the program of the CPU that perform the function disclosed at, column 8, lines 44-65); and a dot formation module that creates the multiple different types of dots (e.g., blocks S350, S430, S440, S450..., figure 12) at the determined positions of the dot-on pixels (e.g., figure 15; the program of the CPU that perform the function disclosed at, column 7, lines 52-67).

Otsuki discloses a priority order specification module that specifies a priority order of individual pixels in the pixel group for dot creation (e.g., depending on drive signals output by masking control circuit are sent to the ejection drive elements in response to the first drive signal, or second drive signal, or third drive signal to produce a first dot type, or second dot type, or third dot type etc., column 5, lines 12 - 60; figure 10A-F, column 7, lines 17-27). Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to have modified Shimuzu to include a priority order specification module that specifies a priority order of individual pixels in the pixel group for dot creation as taught by Otsuki and to include image output device comprising: a number data receiving module that receives the dot number data of the pixel group with respect to each type of dot; a pixel position determination module that determines positions of dot-on pixels in the pixel group with respect to each type

of dot, based on the dot number data of the pixel group with respect to each type of dot and the specified priority order; and a dot formation module that creates the multiple different types of dots at the determined positions of the dot-on pixels as taught by Shimada. It would have been obvious to one of ordinary skill in the art at the time of the invention to have modified Shimuzu by the teaching of Otsuki to process and record image pixels more efficiently and to have modified Shimuzu by the teaching of Shimada to prevent of banding in a printing device.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-8, 16, 17, 20 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shimizu et al. (Shimizu) (20030112293) in view of Otsuki (US 6,652,067) and Shimada et al. (Shimada) (US 6,293,643).

With regard to claim 1, Shimizu discloses an image output control system (e.g., figure 2, paragraph 0045) comprising an image processing device (e.g., a control/operation portion 13, paragraph 0045) that makes image data subjected to a preset series of image processing, and an image output device that creates multiple different types of dots having different densities per unit area according to a result of the preset series of image processing, so as to output an image (e.g., the recording head can form a plurality of kinds of dots, paragraphs 0014,

0047), said image processing device comprising: a dot number determination module (e.g., printer driver, paragraph 0047) that determines a number of dots to be created in each pixel group, which is set to have a predetermined number of multiple pixels included in the image, with respect to each of the multiple different types of dots according to the image data (paragraph 0068); and a number data output module that outputs (e.g., the program of the control/operation portion 13 that perform the function disclosed, paragraph 0071) the determined number of dots to be created in the pixel group with respect to each type of dot, as dot number data of the pixel group (e.g., the kind of dot for at least one color is different from the kinds of dot for other colors, paragraphs 0015, 0072, 0073), to said image output device (e.g., a printing system, figure 2, paragraphs 0044, 0045).

Shimuzu differs from claim 1, in that he does not explicitly teach image output device comprising: a number data receiving module that receives the dot number data of the pixel group with respect to each type of dot; a pixel position determination module that determines positions of dot-on pixels in the pixel group with respect to each type of dot, based on the dot number data of the pixel group with respect to each type of dot and the specified priority order; and a dot formation module that creates the multiple different types of dots at the determined positions of the dot-on pixels and a priority order specification module that specifies a priority order of individual pixels in the pixel group for dot creation.

Shimada discloses image output device comprising: a number data receiving module that receives the dot number data of the pixel group with respect to each type of dot (e.g., figure 12, column 10, lines 48-52); a transfer buffer that outputs dot on-off signals to the ink spout heads, column 8, lines 54-65); a pixel position determination module that determines positions of dot-on pixels in the pixel group with respect to each type of dot, based on the dot number data of the pixel group with respect to each type of dot (e.g., the program of the CPU that perform the function disclosed at, column 8, lines 44-65); and a dot formation module that creates the multiple different types of dots (e.g., blocks S350, S430, S440, S450..., figure 12) at the determined positions of the dot-on pixels (e.g., figure 15; the program of the CPU that perform the function disclosed at, column 7, lines 52-67).

Otsuki discloses a priority order specification module that specifies a priority order of individual pixels in the pixel group for dot creation (e.g., depending on drive signals output by masking control circuit are sent to the ejection drive elements in response to the first drive signal, or second drive signal, or third drive signal to produce a first dot type, or second dot type, or third dot type etc., column 5, lines 12 - 60; figure 10A-F, column 7, lines 17-27).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to have modified Shimuzu to include a priority order specification module that specifies a priority order of individual pixels in the pixel group for dot creation as taught by Otsuki and to include image output device comprising: a number data receiving module that receives the dot number data of

the pixel group with respect to each type of dot; a pixel position determination module that determines positions of dot-on pixels in the pixel group with respect to each type of dot, based on the dot number data of the pixel group with respect to each type of dot and the specified priority order; and a dot formation module that creates the multiple different types of dots at the determined positions of the dot-on pixels as taught by Shimada. It would have been obvious to one of ordinary skill in the art at the time of the invention to have modified Shimuzu by the teaching of Otsuki to process and record image pixels more efficiently and to have modified Shimuzu by the teaching of Shimada to prevent of banding in a printing device.

With regard to claim 2, Otsuki discloses wherein said priority order specification module selects one out of multiple options for the priority order, which are provided in advance, with respect to the pixel group (e.g., figures 10A-F, column 7, lines 1-27).

With regard to claim 3, Shimuzu and Shimada disclose wherein said number data output module has a dot number combination mapping table that maps each combination of numbers of the multiple different types of dots to a preset code (paragraph 0092, Shimizu), said number data output module (e.g., control/operation portion 13, paragraph 0090, Shimizu) refers to the dot number combination mapping table to convert a combination of the numbers of the respective types of dots determined with respect to the pixel group to a corresponding preset code and outputs the preset code, in place of the dot number data of the pixel group, to said image output device (paragraphs 0090,

0091 and 0092, Shimizu), and said number data receiving module comprises: a code mapping table that maps each preset code to a combination of the numbers of the multiple different types of dots (e.g., figure 26, column 15, lines 52-65, Shimada); and a number data conversion module that receives the output preset code of the pixel group, and refers to the code mapping table to reconvert the received preset code to dot number data of the pixel group with respect to each type of dot (e.g., the program of the control circuit that perform the function disclosed at column 16, lines 16-29, Shimada).

With regard to claim 4, Shimada discloses wherein said pixel position determination module sequentially determines the positions of the dot-on pixels with respect to each type of dot in a descending order of the density per unit area of the multiple different types of dots (column 10, lines 9-15).

With regard to claim 5, Shimizu discloses wherein said dot number determination module comprises: a first dot density data generation module that generates first dot density data representing a density of a first dot to be created in the pixel group, based on the image data, where the first dot has a highest density per unit area among the multiple different types of dots (e.g., the program of the control/operation portion 13 that perform the function disclosed at, paragraphs 0071, 0072), a second dot density data generation module that generates second dot density data representing a density of either of the first dot and a second dot to be created in the pixel group, based on the image data, where the second dot has a second highest density per unit area among the

multiple different types of dots (e.g., the program of the control/operation portion 13 that perform the function disclosed at, paragraphs 0071, 0072); a threshold value group storage module that stores a threshold value group consisting of multiple threshold values, which respectively correspond to the predetermined number of multiple pixels included in the pixel group (e.g., employing different threshold values, paragraph 0076); a first dot number determination module that compares the first dot density data with the threshold values included in the threshold value group and sets a number of threshold values that are smaller than the first dot density data to a number of the first dots to be created in the pixel group (paragraph 0076); and a second dot number determination module that compares the second dot density data with the threshold values included in the threshold value group and sets a number of the second dots to be created in the pixel group, based on the preset number of the first dots and a number of threshold values that are smaller than the second dot density data, said second dot number determination module comparing the second dot density data with only threshold values that are greater than the first dot density data and counting the number of the threshold values that are smaller than the second dot density data, so as to set the number of the second dots to be created in the pixel group (paragraphs 0076, 0077, 0078).

With regard to claim 6, Shimizu discloses an image output control system in accordance with claim 5, wherein said threshold value group storage module stores the multiple threshold values of the threshold value group in an order of magnitude of the respective threshold value in the threshold value group, and

said second dot number determination module selects the threshold values that are greater than the first dot density data, on the basis of the order of magnitude (e.g., the processing employ different threshold values, paragraph 0076).

With regard to claim 7, Shimizu discloses wherein said first dot number determination module starts comparison of the first dot density data from a threshold value having an ordinal number selected on the basis of a most-recent setting of the number of the first dots, and counts the number of the threshold values that are smaller than the first dot density data (e.g., figures 9 and 10, paragraph 0076).

With regard to claim 8, Shimizu discloses wherein said second dot number determination module, in the case of absence of any threshold value that is smaller than the first dot density data, starts comparison of the second dot density data from a threshold value having an ordinal number selected on the basis of a most-recent setting of the number of the second dots (paragraph 0076).

Referring to claim 16:

Claim 16 is the method claim corresponding to operation of the device in claim 1 with method steps corresponding directly to the function of device elements in claim 1. Therefore claim 16 is rejected as set forth above for claim 1.

Referring to claim 17:

Claim 17 is the method claim corresponding to operation of the device in claim 5 with method steps corresponding directly to the function of device elements in claim 5. Therefore claim 17 is rejected as set forth above for claim 5.

Referring to claim 20:

Claim 20 is the computer program claim corresponding to operation of the device in claim 1 with program steps corresponding directly to the function of device elements in claim 1. Therefore claim 20 is rejected as set forth above for claim 1.

With regard to claim 23, the subject matter is similar to claim 1. Therefore claim 23 is rejected as set forth above for claim 1.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Quang N. Vo whose telephone number is 5712701121. The examiner can normally be reached on 7:30AM-5:00PM Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, King Y. Poon can be reached on 5712727440. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Quang N. Vo 2/12/08
Patent Examiner

KING Y. POON
SUPERVISORY PATENT EXAMINER